

Nathan R. De Jager

Research Ecologist

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Education

2008 PhD in Ecology, Evolution, and Behavior with a minor in Conservation Biology
University of Minnesota, St. Paul Minnesota, USA

2005 MSc in Biology with a minor in Applied and Computational Mathematics
University of Minnesota, Duluth, Minnesota, USA

2001 BA in Biology/Environmental Science
Northwestern College, Orange City, Iowa, USA

Professional Experience

2008- Research Ecologist, Upper Midwest Environmental Sciences Center, US
Geological Survey, La Crosse, WI

2012- Adjunct Senior Lecturer, University of New England, Riverine Landscapes
Research Laboratory, Armidale NSW, Australia

2009- Adjunct Graduate Faculty, Department of Biology and River Studies Center,
University of Wisconsin-La Crosse, La Crosse, WI

2004-2008 Graduate Research Assistant (PhD), University of Minnesota.

2003 Graduate Research Assistant (MSc) Swedish University of Agricultural Sciences
(SLU), Umeå Sweden.

2002-2004 Graduate Teaching Assistant (MSc), University of Minnesota, Duluth, MN

2001-2002 Soil Conservation Technician, Natural Resources Conservation Service, US
Department of Agriculture, Boone, IA

1999-2000 Soil Conservation Technician, Natural Resources Conservation Service, US
Department of Agriculture Orange City, IA

Professional Services

Principal Investigator for Landscape Ecology: Upper Mississippi River Restoration-
Environmental Management Program

President: Mississippi River Research Consortium 2012-2013

Vice President: Mississippi River Research Consortium 2011-2012

Member: International Association for Landscape Ecology and Ecological Society of America
 Reviewer: Ecoscience, Ecosphere, Forest Ecology and Management, Hydrobiologia, Journal of Applied Ecology, Landscape Ecology, River Systems, Silva Fennica

Funded Project Proposals, Grants and Contracts

De Jager, N.R. 2016-2018. Landscape pattern research on the Upper Mississippi River System: synthesis and significance. U.S. Army Corps of Engineers Upper Mississippi River Restoration Program (\$589,018).

De Jager, N.R., Romanski, M.C., Sturtevant, B.R., Fox, T.J., Rohweder, J.J. 2014-2015. Assessing ecological impacts of moose herbivory under varying moose population densities absent the regulatory effects of wolves on Isle Royale. USGS/NPS Natural Resources Preservation Program (\$118,128).

De Jager, N.R. 2012-2015. Landscape Pattern Research and Application on the Upper Mississippi River System. U.S. Army Corps of Engineers. 2013-2015 (\$505,000).

De Jager, N.R. 2010-2012. Development of landscape pattern indices for the Upper Mississippi River System. U.S. Army Corps of Engineers. 2010-2012 (\$330,616).

De Jager, N.R. 2010. Effects of landscape patterns on forest community composition and aquatic nutrient concentrations along the Upper Mississippi and Illinois Rivers, USA. US Army Corps of Engineers/US Geological Survey, Long Term Resource Monitoring Program-Additional Program Element (\$84,000).

Guntenspergen, GR, Rohweder, JJ, De Jager, NR. 2010-2011. Development of a decision support system to examine how habitat corridors could ameliorate the impact of habitat fragmentation at Acadia National Park caused by development. USGS/NPS Natural Resources Preservation Program (\$152,567).

De Jager, N.R. and Nelson, J.C. 2009. Quantifying changes in landscape patterns of the Upper Mississippi River System in space and time. US Army Corps of Engineers/US Geological Survey Long Term Resource Monitoring Program-Additional Program Element. (\$63,000)

De Jager, N.R. 2006. Multiple-scale spatial dynamics of the moose-forest-soil ecosystem of Isle Royale National Park, MI, USA. Dissertation Fellowship, University of Minnesota. 2006-2007 (\$21,500)

De Jager, N.R. and F. Van Dyke. 1999. Riparian Habitat and Prairie Restoration Project Proposal to Northwestern College President and Farm Committee. (Commitment of 20 acres for 20 years and funding totaling \$5,000)

Publications

De Jager, N.R., Houser, J.N., Ickes, B.S. In Review. Patchiness in a large floodplain river: associations among hydrology, nutrients, and fish communities. *River Research and Applications*.

De Jager, N.R., Swanson, W., Strauss, E.A., Thomsen, M.T., Yin, Y. 2015. Flood pulse effects on nitrification in a floodplain forest impacted by deer browsing and invasion by *Phalaris arundinacea*. *Wetlands Ecology and Management*. DOI 10.1007/s11273-015-9445-z

De Jager, N.R., Rohweder, J.J., Yin, Y., Hoy, E. 2015. The Upper Mississippi River floodscape: spatial patterns of flood inundation and associated plant community distributions. *Applied Vegetation Science*. Doi: 10.1111/avsc.12189

Kreiling, R.M., De Jager, N.R., Swanson, W., Strauss, E.A., Thomsen, M.T. 2015. Effects of flooding on ion exchange rates in an Upper Mississippi River Floodplain Forest impacted by herbivory, invasion, and restoration. *Wetlands*. DOI 10.1007/s13157-015-0675-x

Scown, M., Thoms, M. and De Jager, N. R. 2015. Measuring floodplain spatial patterns using continuous surface metrics at multiple scales. *Geomorphology* 245:87-101.

Scown, M., Thoms, M. and De Jager, N. R. 2015. Floodplain complexity and surface metrics: influence of scale and geomorphology. *Geomorphology* 245:102-116.

Scown, M., Thoms, M. and De Jager, N. R. (In Press). 'Measuring spatial pattern in floodplains: A step towards understanding the complexity of floodplain ecosystems'. In: *River Science: Research and Applications for the 21st Century*. D. J. Gilvear, M. Greenwood, M. Thoms and P. Wood (eds). John Wiley and Sons, UK, pp.

Cogger, B.J. De Jager, N.R. Thomsen, M. 2014. Winter browse selection by white-tailed deer in bottomland forest restorations of the Upper Mississippi River Valley, USA. *Natural Areas Journal*. 34:144-153.

De Jager, N.R. and Fox, T.J. 2013. Curve Fit: A pixel-level raster regression tool for mapping landscape patterns. *Methods in Ecology and Evolution* 4: 789-792.

De Jager, N.R., Cogger, B.J., and Thomsen, M.T. 2013. Interactive effects of flooding and deer browsing on floodplain forest recruitment. *Forest Ecology and Management* 303:11-19.

Pastor, J. and De Jager, N.R. 2013. Simulated responses of moose populations to browsing-induced changes in plant architecture and forage production. *Oikos* 122:575-582.

De Jager, N.R. and Houser, J.N. 2012. Variation in water mediated connectivity influences patch distributions of total nitrogen (TN), total phosphorous (TP) and TN:TP ratios in the Upper Mississippi River, USA. *Freshwater Science* 31: 1254-1272.

- De Jager, N.R. 2012. The allometry of community level stem size-density distributions in a floodplain forest. *American Journal of Botany* 99: 1572-1576.
- De Jager, N.R. Thomsen, M.T., Yin, Y. 2012. Threshold effects of flood duration on the vegetation and soils of the Upper Mississippi River floodplain, USA. *Forest Ecology and Management* 270:135-146.
- De Jager, N.R, Rohweder, J.J., and J.C. Nelson. 2011. Past and predicted future changes in the land cover of the Upper Mississippi River floodplain, USA. *River Research and Applications*. 10.1002/rra.1615
- De Jager, N.R. and Rohweder, 2011. Spatial Patterns of aquatic habitat richness in the Upper Mississippi River floodplain, USA. *Ecological Indicators* 13:275-283.
- De Jager, N.R. and Rohweder, J.J. 2011. Spatial scaling of core and dominant forest cover in the Upper Mississippi and Illinois River floodplains, USA. *Landscape Ecology* 26: 697-708
- De Jager, N.R. and Yin, Y. 2010. Temporal changes in spatial patterns of submersed macrophytes in two impounded reaches of the Upper Mississippi River, USA, 1998-2009. *River Systems* 19:129-141.
- De Jager, N.R. and Pastor, J. 2010. Effects of simulated moose browsing on the growth and morphology of Rowan (*Sorbus aucuparia*). *Wildlife Biology* 16: 301-307.
- De Jager, N.R., Pastor, J., Hodgson, A.L. 2009. Scaling the effects of moose browsing on forage distribution from plant canopies to landscapes. *Ecological Monographs*, 79: 281-297.
- De Jager, N.R. and Pastor, J. 2009. Declines in moose population density at Isle Royale National Park, MI, USA and accompanied changes in landscape patterns. *Landscape Ecology* 24: 1389-1403.
- De Jager, N.R. and Pastor, J. 2008. Effects of moose population density and site productivity on the canopy geometries of birch (*Betula pubescens* and *B. pendula*) and Scots pine (*Pinus sylvestris*). *Wildlife Biology* 14. 251-262.
- Van Dyke, F., B. Darby, S.E. Bowdish, J. D. Schmeling, and N.R. De Jager. 2002. Ecosystem Management and Moose: Creating a Coherent Concept with Functional Management Strategies. *Alces* 38: 55-72.

Technical Reports

- De Jager, N.R. and Rohweder, J.J. 2012. Exploring relationships among land ownership, agricultural land use, and native fish species richness in the Upper Mississippi River Basin. Contract Report prepared for the Midwest Association of Fish and Wildlife Agencies. 12 pp.

Rohweder, J.J., De Jager, N.R. and Guntenspergen, G.R. 2011. Anticipated effects of development on habitat fragmentation and the movement of mammals into and out of the Schoodic District of Acadia National Park, Maine, USA. Contract Report prepared for Acadia National Park. 70 pp. Available online at: <http://pubs.usgs.gov/sir/2012/5149/>

Steingraeber, M.T., J.J. Rohweder, S.T. Yess, and N.R. DeJager. 2009. Fishers and Farmers Partnership Program for the Upper Mississippi River Basin: assessment team report. U.S. Fish and Wildlife Service, Onalaska, Wisconsin. 30 pp. Available on-line at <http://www.fishersandfarmers.org/documents.html>

Presentations (*list only includes presentations given in person by N.R. De Jager, * denotes invited presentations*)

De Jager, N.R., Rohweder, J.J., Fox, T.J., Romanski, M.C., Miranda, B., Sturtevant, B.R. 2015. Simulating wolf-moose-forest trophic interactions at Isle Royale National Park-application of the LANDIS-II Browse Disturbance Extension. July 2015. International Association for Landscape Ecology.

*De Jager, N.R. Landscape pattern research on the Upper Mississippi River System: toward synthesis and significance. Feb. 2015. Upper Mississippi River Restoration-Coordinating Committee.

De Jager, N.R. Rohweder, J.J., Fox, T., Yin, Y. 2014. Modeling and mapping flood inundation along the Upper Mississippi River: Implications for the study and management of floodplain vegetation and soil dynamics. May, 2014. International Association for Landscape Ecology, U.S. Chapter.

De Jager, N.R., Rohweder, J.J., Yin, Y. 2014. Modeling and mapping flood inundation along the Upper Mississippi River: Implications for the study and management of floodplain vegetation and soil dynamics. April 2014. Mississippi River Research Consortium.

De Jager, N.R., Thomsen, M.T., Strauss, E.A., Cogger, B.J., Swanson, W. 2013. Interactive effects of flooding and deer browsing on floodplain vegetation and nitrogen dynamics. August 2012. Ecological Society of America, Minneapolis, MN, USA.

De Jager, N.R. and Houser, J.N. 2012. Variation in water mediated connectivity influences patch distributions of total nitrogen, total phosphorous and TN:TP ratios in the Upper Mississippi River, USA. August, 2012. Ecological Society of America, Portland, OR, USA

De Jager, N.R. 2012. Spatial patterns of aquatic habitat richness in the Upper Mississippi River, USA. August 2012. American Fisheries Society, Minneapolis, MN, USA

De Jager, N.R. and Houser, J.N. 2011. Spatial clustering of total nitrogen, total phosphorous and TN:TP in the Upper Mississippi River, USA. April 26, 2011. Mississippi River Research Consortium, La Crosse, WI, USA.

De Jager, N.R., Thomsen, M.T. and Yin, Y. 2011. Threshold effects of flood duration on the vegetation and soils of the Upper Mississippi River floodplain, USA. April 26, 2011. Mississippi River Research Consortium, La Crosse, WI, USA.

De Jager, N.R., Thomsen, M.T. and Yin, Y. 2011. Threshold effects of flood duration on the vegetation and soils of the Upper Mississippi River floodplain, USA. April 5, 2011. US-International Association for Landscape Ecology Symposium, Portland, OR, USA.

*De Jager, N.R., Cogger, B., and Thomsen, M.T. 2011. Interactive effects of flooding and herbivory by white-tailed deer on tree seedling recruitment in the Upper Mississippi River floodplain. March 8, 2011. Bottomland Ecosystem Restoration Conference, National Great Rivers Research and Education Center, Collinsville, IL, USA.

*De Jager, N.R. 2010. Results from 2009 Additional Program Element: Quantifying spatial patterns of the Upper Mississippi River System in space and time. Environmental Management Program Analysis Team Meeting. National Great Rivers Research and Education Center, Godfrey, IL, USA.

*De Jager, N.R. 2010. Threshold effects of flood duration on the vegetation and soils of the Upper Mississippi River floodplain. Sept. 9, 2011. U.S. Army Corps of Engineers fall forestry meeting. Le Claire, IA, USA.

De Jager, N.R. 2010. Departure from quarter-power scaling of aquatic habitat richness-area as an indicator of riverscape organization. June 2010. Association for the Sciences of Limnology and Oceanography/North American Benthological Society. Santa Fe, NM.

De Jager, N.R. 2010. Departure from quarter-power scaling of aquatic habitat richness-area as an indicator of riverscape organization. June 2010. 3rd Annual USGS Modeling conference, Denver, CO.

De Jager, N.R. 2010. Departure from quarter-power scaling of aquatic habitat richness-area as an indicator of riverscape organization. April 28, 2010. Upper Mississippi River Research Consortium, La Crosse, WI

*De Jager, N.R. 2009, 2010 Effects of the world's large herbivores on plant and ecosystem dynamics. University of Wisconsin La Crosse, Ecology class.

*De Jager, N.R. 2009. Indicators of landscape pattern for the Upper Mississippi River floodplain landscape. Upper Mississippi River Basin Association, Rock Island, IL.

*De Jager, N.R. 2008. Dynamic Landscape Indicators for the Upper Mississippi River System. Environmental Management Program Analysis Team meeting, Dubuque, IA.

De Jager, N.R. 2008. Multiple scale spatial dynamics of the moose-forest-soil ecosystem of Isle Royale National Park, MI, USA. University of Minnesota Twin Cities Ecology, Evolution, and Behavior Seminar Series, St. Paul, MN.

De Jager, N.R. 2006. Interactions between moose population density and landscape patterns at Isle Royale National Park, MI, USA. University of Minnesota Twin Cities Conservation Biology Seminar Series, St. Paul, MN

*De Jager, N.R. 2005. Moose in the fractal forest. Wheaton College Biology Seminar Series.

De Jager, N.R. 2004, 2005. Effects of moose population density and soil fertility on the growth and morphology of birch and Scots pine in northern coastal Sweden. University of Minnesota Duluth Biology Series Seminar, Duluth MN (2004, 2005)

*De Jager, N.R. 2003. Moose in the fractal forest. Swedish University of Agricultural Sciences (SLU), Umeå Sweden.

Graduate Student Projects

Benjamin J. Cogger (M.S.) 2010-2012. Interactive effects of flooding and deer browsing on floodplain forest recruitment in the Upper Mississippi River Floodplain, USA. University of Wisconsin-La Crosse. Co-Advised with Meredith Thomsen.

Whitney Swanson (M.S.) 2013-Present. Effects of elevated nitrogen on nitrogen dynamics in floodplain forest and invasive reed canarygrass communities along the Upper Mississippi River floodplain. University of Wisconsin-La Crosse. Co-Advised with Eric Strauss.

Alicia Weeks (M.S.) 2014-Present. Modeling spatial relationships between the invasive snail *Bithynia tentaculata* and submersed aquatic vegetation using long-term monitoring data. Co-Advised with Roger Haro.

Murray Scown (PhD) 2012-2015. The spatial complexity of floodplain landscapes. University of New England, Riverine Landscape Research Laboratory, Armidale, NSW, Australia. Co-Advised with Martin Thoms.